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**European Patent Number:** 0777 863  
**Application Number:** 95 930 610.1  
**Patent Proprietor:** British Telecommunications plc  
**Title:** Navigation Information System

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**OPPOSITION**

is hereby filed in the name and on behalf of

Mannesmann-Aktiengesellschaft  
Mannesmannufer 2  
40213 Düsseldorf / DE

with a request to revoke the granted patent in its entirety.

Alternatively, a request for oral proceedings is submitted.

The opposition is based on :

1. lack of novelty in accordance with Art. 54, and
2. lack of an inventive step in accordance with Art. 56 EPC.

Please debit the opposition fee in the sum of 613.00 EUR from the following account:

28000512 P.E. Meissner

**Grounds:**

The opposition is based on:

D1 DE 41 39 581 A1

D2 Information for all employees of Mannesmann VDO AG "Verkehrstelematik: Ein Schritt auf dem Weg zur intelligenten Straße" ["Traffic telematics: A step on the way

towards the intelligent road”], dated May 1994 (formerly VDO Adolf Schindling AG, D-64832 Babenhausen)

- D3 “Funkschau” Journal, 22/1986, pp. 99-102
- D4 “Telematik für den Verkehr in Europa” [“Telematics for traffic in Europe”], accompanying brochure to the “Telematik für den Verkehr in Europa” [“Telematics for traffic in Europe”] exhibition held on 22/23 July 1994 at the Forum of the Schloßpark, Ludwigsburg, published by the Verband der Automobilindustrie e.v. (VDA), Frankfurt/Main

- D5 Euro-Scout’s ..., 93AT025, pp. 59-66, by Mr H. Sodeikat, Siemens AG

and the prior art already discussed in the examination proceedings.

- D6 EP-A-0 174 540

- D7 EP-A-0 601 293

- D8 GB-A-2 176 964

- D9 GB-A-2 271 486

- D10 EP-A-0 379 198

- D11 EP-A-0 604 404

- D12 GB-A-2 264 837

Claim 1:

D1 discloses a navigation system (D1, column 3, l. 44: “Navigation method”, the performance of which, for the person skilled in the art, clearly requires a navigation system) for the provision of information (D1, column 46 to 47 [*sic*]: Route recommendation) for one or more mobile users (D1, column 3, l. 44: For motor vehicles) depending on their locations (D1, column 3, l. 45-47: From ... starting location and ... location), where the following system components are indicated to carry out the method:

A device to determine the location of a mobile unit (column 3, l. 46: Determination of the current location), which requires guidance information (implicitly through transfer of information relating to the location<sup>1</sup> and destination, D1, column 3, l. 47-48),  
a device to generate information to guide the user of the mobile unit according to the current location of the mobile unit (column 3, l. 45-47: from ... location ... a route recommendation is transmitted to the vehicle user),

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<sup>1</sup> **Translator’s Note:** Document D1 is misquoted here. D1 uses the term “Startort” [“starting location”] and not “Standort” [“location”].

a communications system to transmit the guidance information generated in this way to the mobile unit (D1, column 3, lines 53 to 55: Route recommendation ... transferred to the motor vehicle),

a device to receive requests from the mobile unit relating to a specified destination (D1, column 3, l. 48-51: Destination location is transmitted from the motor vehicle to a control centre by means of a communications device) and a device (control centre, col. 3, line 50) to generate guidance information (l. 53: Route recommendation) according to the specified destination (l. 45-46: Route recommendation transmitted from the specification of ... destination ...),

wherein guidance information depending on both the current location and the specified destination of the mobile unit can be transmitted to the mobile unit (D1, column 3, l. 44 -47: "From the specification of ... destination ... and the current location, a route recommendation is transmitted to the vehicle user", and in terms of the transmission to the mobile unit: D1, column 3, l. 60-61: "that the control centre transmits the route recommendation to the motor vehicle in segments for the relevant location").

Thus, the subject matter of claim 1 of the contested patent is no longer novel compared with D1. The fact that, in D1, the features are formulated in relation to a method (particularly in claim 1 thereof) makes no difference to the person skilled in the art due to his specialist knowledge compared with the formulation according to the contested patent, claim 1, as a device-based system, since he knows that a method is to be carried out with a device, whereby the method features of D1 correspond in each case to device features of the contested patent, claim 1. Even if this were not accepted, the subject matter of claim 1 of the contested patent would no longer be based on an inventive step, since it is obvious to the person skilled in the art that the device features of claim 1 of the contested patent are derived directly from the method features in D1.

#### Independent claim 18:

The provision in a navigation system of not only a central unit according to one of claims 1 to 17, but also mobile units (in the form of motor vehicles according to D1 loc. cit.) which communicate with the fixed component (control centre in D1), is blatantly obvious, since these very mobile units are intended to receive navigation instructions from the stationary control centre. The fact that requests for guidance information relating to a destination specified by the user of the mobile unit are sent from the mobile units to the stationary component is also blatantly obvious, since the user of the mobile units is intended to receive navigation instructions for his required destination; moreover, as explained above, this is already known from D1. The fact that the mobile units contain means for receiving the guidance information from the stationary component is likewise blatantly obvious, since they could not otherwise receive the guidance information and display it for the user; moreover, this is also disclosed in D1 in that route recommendations are transmitted to the motor vehicle (D1, column 3, l. 55), where it is obvious that the vehicle must have a receiving device for this purpose. Thus, the subject matter of claim 18, in the light of the specialist knowledge of the person skilled in the art, is no longer novel, or at least no longer inventive, compared with D1.

Formally independent claim 25:

The person skilled in the art also reads about a mobile unit for a navigation information system in D1, column 3, lines 44 to 61 in that a navigation method for motor vehicles is presented for which a terminal unit is obviously provided in the vehicle. A person skilled in the art reads about a device for identifying the current position of the mobile unit in D1, column 1, lines 52-53, in that the relevant location of the motor vehicle is also notified to the control centre, for which, as a matter of course for the person skilled in the art, a position recording device is provided. A device for transmitting information relating to the current location of the mobile unit via a communications link can be read by the person skilled in the art in D1, column 3, line 58 ("that the information relating to the current location is likewise transmitted during a journey to the control centre"). A guidance command device, which can be controlled by the guidance command information received via the communications link, is disclosed to the person skilled in the art, for example in the form of an optical route indicator (D1, column 1, line 45).

The fact that the guidance commands relating to the current location can be transferred to a user by means of the guidance command means is disclosed by D1, column 3, lines 60-62.

The fact that the mobile unit has a device to generate a request for guidance relating to a specified destination is trivial and can be inferred from the fact that, according to D1, column 3, lines 45-48, it specifies its destination, which is seen as a request, since a route recommendation is then transmitted to the vehicle users. Means for receiving routing command are obvious to the person skilled in the art in that the route recommendations are transmitted via communications means from the control centre to the motor vehicle (D1, column 3, lines 53-55). The fact that the route recommendations relate to the current location and the specified destination is, as already explained, evident from D1, column 3, lines 45-48.

Thus, the subject matter of claim 25 is no longer novel compared with D1, taking into account the specialist knowledge of the person skilled in the art. If the specialist knowledge of the person skilled in the art were not taken into account in the examination of novelty, the subject matter of claim 25 would no longer be inventive compared with D1 for the above reasons on the basis of the specialist knowledge of the person skilled in the art and the disclosure in D1 according to the above explanations.

Independent claim 30:

The features of the further independent claim 30 are likewise disclosed in D1: D1 discloses a method for providing navigation guidance information for mobile units of a mobile radio system (D1, column 3, lines 44-49): where the information depends on the locations of the mobile units (D1, column 3, line 46), where the method contains the following steps:

- Transmission of a request for navigation guidance from a mobile unit to a stationary component: D1, column 3, lines 48-55, where, by indicating destination information, a route recommendation is requested by a motor vehicle from a control centre,
- Definition of the location of the mobile unit (in accordance with D1, column 1, lines 51-53: Since the relevant location of the motor vehicle is notified to the control centre, this vehicle must have determined its location. see also column 2, lines 30-32),

- Generation of guidance information on the basis of the location information of the navigation data stored in the stationary component (D1, column 3, lines 44-48: "a route recommendation is transmitted ... from ... the determination of the current location" in terms of the basing of the guidance information on location information and D1, column 3, in particular lines 21-23 ("determination of the route of the motor vehicle from A to B") in terms of the navigation data stored in the stationary component, and
- transmission of the route information from the stationary component to the mobile unit (D1, column 3, lines 52-55),  
 where the request for navigation information (in D1 through transfer of the destination information) contains a specified destination (D1, column 3, line 45: Destination) and the generated guidance information is selected according to the location information and the requested destination (D1, column 3, lines 44-49: route recommendation to the vehicle user from ... destination and ... current location),  
 where guidance information which is significant for the current location (D1, column 3, line 46: current location) and for the specified destination (line 45: Destination) of the mobile unit ("route recommendation determined from destination and location") is transmitted to the mobile unit ("motor vehicles").

Thus, the subject matter of claim 30 is no longer novel compared with D1, taking into account the specialist knowledge of the person skilled in the art. If the specialist knowledge of the person skilled in the art were not taken into account in the examination of novelty, the subject matter of claim 30 would no longer be based on an inventive step on the basis of specialist knowledge compared with D1.

D2, which was distributed among a large number of employees at VDO Adolf Schindling AG, D-Babenhausen, as an in-house journal, discloses, before the priority date of the application, mobile units and methods according to the independent claims of the contested patent. Thus, the attached copy of D2 discloses, on the first page of the copy, right-hand column, to the second page of the copy, middle of the middle column, a position-recording system in the form of GPS, a data radio computer with radio cells (to the person skilled in the art obviously mobile radio), where a position determination of the vehicle is performed via GPS, the subscriber transfers his location and destination guidance request to the central data radio computer network, an up-to-date route plan is drawn up by the central computer according to the location and destination guidance request and is indicated to the driver on a screen. The fact that, to do this, the current location of the mobile subscriber and his destination guidance request are transmitted to the control centre and the guidance information generated therefrom must be transmitted back to the driver in order to enable visual display therein, is immediately obvious to the person skilled in the art on the basis of the quoted text passage and also on the basis of the illustration presented in D2, page 01 in the appendix, and on the basis of his specialist knowledge. Thus, the subjects of the device-related and method-related formulations of the claims of the contested patent are similarly no longer novel compared with D2, or at least are no longer inventive. Witness statements relating to the distribution of D2 to a large number of employees without non-disclosure stipulations can be provided if required.

Even a combination of D1 with D2, in the latter of which a position-recording system is explicitly indicated, would be obvious due to the similar specialist area and would preclude the patentability of the claims of the contested patent.

Similarly, D3 discloses a navigation system, a navigation method and a mobile unit according to the independent claims of the contested patent. Thus, D3, page 99, Figure, indicates a terminal in a motor vehicle with a location device, a navigation device, an input keypad, a direction indicator, a destination memory, to which (traffic-dependent) routing recommendations from his current location to his destination are transferred from a traffic routing computer VLR via beacon communication BE, EB, SB. The fact that the routes are determined centrally is disclosed in D3, page 100, right-hand side, middle (the traffic-routing control centre routing traffic flows onto specific roads with the specification of routes). The fact that the route recommendations from the recorded current vehicle location to its destination which can be input via an input keypad and which is stored in the destination memory is immediately obvious to the person skilled in the art, since other route recommendations would be simply inappropriate. Thus, the subject matter of the independent claims of D1 [*sic*] is also no longer novel, or at least no longer inventive, compared with D3.

D4, the content of which was disclosed to the person skilled in the art without a non-disclosure agreement by VDA, on the one hand at an exhibition on 22/23 July 1994, and on the other hand in an accompanying brochure issued there, discloses, on page 13, paragraph 3, the destination input of a car driver, transfer of the information to a central computer and transfer of a most suitable route back from a central computer, where mobile radio is disclosed as the communications system (page 13, right-hand side) and the GPS already familiar to the person skilled in the art is disclosed for location determination. Thus, on the basis of D4, taking into account the specialist knowledge of the person skilled in the art, the subject matter of the independent claims of the contested patent can be derived without novelty, or at least without an inventive step.

D5 (page 61, Figure and description) also discloses destination guidance of a vehicle by a control centre.

The subject matters of the dependent claims are in each case no longer novel, or at least no longer based on an inventive step for the person skilled in the art taking into account his specialist knowledge, on the basis of each of the above documents D1, D2, D3, D4.

Furthermore, allocations of positions normally recorded by the person skilled in the art through dead-reckoning navigation or GPS, and abstracted digital maps of the traffic network (according to claims 2-6) were known to the person skilled in the art even before the priority date of the contested patent, *inter alia* under the term Map Matching, on the basis of his specialist knowledge and numerous publications. Similarly, memories according to claim 6, input devices according to claim 13 and multi-frequency coders were known to the person skilled in the art long before the priority date and are obviously required for the implementation of a navigation system (memory and input device), or are at the discretion of the person skilled in the art, since they are known from other applications (multi-frequency coders/DTMF coders). Radio location according to claim 17 can similarly be regarded as being known for some time to the person skilled in the art as an alternative to position determination. With regard to claim 19 it is not clear how the "dead reckoning" is intended to

determine the position, so that claim 19 reveals nothing which is comprehensible, based on an inventive step or novel.

Further publications relating to the details have been disclosed in the aforementioned, officially searched documents D6 - D12.

Since the subject matters of the claims of the contested patent are no longer novel, or at least no longer inventive, the initially submitted requests are fully justified.

[signed]

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Patent Attorney

Enc.: 2 duplicate copies  
Citations 1-5 (in triplicate)

**Navigation method for motor vehicles**

In a navigation method for motor vehicles, in which, from the specification of the starting location and destination location and the definition of the current location, a route recommendation is transmitted to the vehicle user, the facility is provided for the information relating to the starting location and the destination location to be transferred by means of a communications device from the motor vehicle to a control centre, for the control centre to determine corresponding route plans and for the route recommendation to be transferred via the communications device from the control centre to the motor vehicle.

**Description**

The invention relates to a navigation method according to the preamble to claim 1.

Methods of this type have been known for some time. The relevant route is determined within the motor vehicle itself from documents which are likewise available in the motor vehicle. These include for example machine-readable card devices or, more recently, town plans and maps, which are stored in the form of CD-ROMs. The specification of the starting location and destination location is normally effected manually, for example by entering both in a suitable form, for example as text into a navigation device within the vehicle.

The known methods have the disadvantage that they are not up-to-date since, for example, temporary traffic jams or necessary diversions are not generally taken into account in the documents concerned. There is the added disadvantage of unwieldy handling of the documents both in the use of the navigation method and also in particular in the case of long routes, in which a changeover between different documents is required.

The object of the invention is to produce a navigation method of the aforementioned type which is simple to operate and which always provides up-to-date route information.

The invention achieves this object by means of the characterising features of claim 1.

The control centre which, for example, is provided once for each Federal region, possesses all the information which is relevant to the vehicle user and his respective route. The vehicle user is faced with neither a handling problem for the documents nor the problem of updating. He simply has to make contact with the control centre and inform it of the starting location and destination location. This can be done via communications devices which are already available, for example a carphone. The route information is then normally transferred on the same transmission path from the control centre to the vehicle user where it is visualised in suitable form, for example as an optical route indicator. With the aid of an intrinsically known navigation device in the vehicle, the relevant location on the pre-defined route can then be displayed immediately.

As an alternative to this, claim 2 describes an advantageous embodiment of the invention. Here, the relevant location of the motor vehicle is also notified to the control centre. This enables the control centre to define deviations from the route and transmit corresponding route recommendations.



This information relating to the current location, if necessary in conjunction with the information provided by the control centre relating to the ongoing route, can be provided, according to a further embodiment of the invention, at regular intervals. These intervals may be both time-related and route-related. The individual movements of the motor vehicles can thereby be tracked in the control centre and, if necessary traffic jams or hold-ups in the traffic flow can be detected from the movement pattern of different vehicles which are provided with travel information by the control centre. Of course, in such a case, the route recommendation may correspond to the relevant traffic situation and a change to the route recommendation may be made both in the case of an actual traffic hold-up and in order to avoid such a hold-up.

Alternatively, the information relating to the current location can also be transferred by the motor vehicle in a route-dependent manner. This would generally include the case where location information is to be transmitted during a journey only at important traffic junction points or significant positions. This operation may, for example, be automatically triggered by the vehicle user in the event of a change in direction and consequent actuation of the indicator switch. Depending on the requirements of the vehicle user and the overall load on the connection network between the control centre and the different vehicles, further information which is relevant to the journey may be transmitted by the control centre. This includes, for example, information relating to places of interest, hotels or shopping facilities, of which the vehicle user is informed as required.

Whereas it was previously assumed that the information relating to the location is transmitted arbitrarily by the vehicle user at the beginning of the journey, the described further development of the invention now deals with an automation of this process. The information relating to the current location can be transferred automatically by the motor vehicle to the control centre or can be obtained from the latter. This can be done, for example, with the aid of a cross-bearing from different transit times of a test signal transmitted by the vehicle. The test signal is picked up, for example, at different times in three receivers physically remote from one another, and unambiguous information relating to the current location of the vehicle is derived therefrom.

As alternative to this, the current location can also be determined from the destination location of the last journey. In the case of automatic communication between the vehicle and the control centre during a journey, the relevant location of the motor vehicle can be retained in the control centre and the location for a new journey can also be derived therefrom. In this case, it is then simply necessary to notify the required destination location to the control centre, which in turn quickly recommends an up-to-date route.

A further facility for automatically determining the location is offered by the continuous transmission of the route pattern, i.e. the route covered both in terms of the change of direction and the route covered in each direction, from the motor vehicle to the control centre. Since every route pattern represents a unique feature for the relevant map section pre-defined by the last known location as a rough reference point, the relevant location can also be determined from this pattern. This can be explained by way of an example:

The figure shows a schematic section of a town plan, within which the motor vehicle is located. This information is derived from the last location of the motor vehicle which is known to the control centre. The motor vehicle is actually located at the point marked as A. The motor vehicle now travels the route drawn in and marked with small arrows to point B.

In doing so, it passes through points marked (1) to (5), at which it in each case changes direction by  $\pm 90^\circ$ . The control centre receives information from the motor vehicle indicating that the motor vehicle is travelling a straight route corresponding to route A to (1) with a length which is equal to the distance between these two points, followed by the information that a change of direction through  $-90^\circ$  has been made, a route has been travelled which corresponds to the distance between points (1) and (2), etc. through to point B, which is characterised in terms of its distance from point (5) and the distance from this point.

From this information, the control centre forms a route pattern which is identical to the route drawn in between points A and B. It then checks this route pattern with the underlying map section and can then unambiguously determine that the motor vehicle must have covered the route from A to B. All other attempts to "accommodate" the route pattern within the town plan result in discrepancies between the route pattern and the relevant map reality, i.e. the possible routes which are provided within the town plan and are therefore pre-defined. The control centre can thus identify the current location of the vehicle, in this case the location B, from the route pattern supplied in sections by the motor vehicle and can forward this to the motor vehicle as up-to-date location information. As is immediately obvious, no knowledge of the location of the starting point A within the town plan is required for this purpose. In order to reduce the computing effort within the control centre, it is merely necessary to define the area within which the motor vehicle is located on the basis of the last known location of the motor vehicle.

#### Claims

1. Navigation method for motor vehicles, in which, from the specification of the starting location and destination location and the definition of the current location, a route recommendation is transmitted to the vehicle user, characterised in that the information relating to the starting location and destination location is transmitted from the motor vehicle to a control centre by means of a communications device, that the control centre determines corresponding route plans and that the route recommendation is transmitted via the communications device from the control centre to the motor vehicle.
2. Navigation method according to claim 1, characterised in that the information relating to the current location is likewise transmitted during a journey to the control centre and that the control centre transmits the route recommendation to the motor vehicle in sections for the relevant location.
3. Navigation device according to claim 2, characterised in that the motor vehicle transmits the information relating to the current location at regular intervals.
4. Navigation device according to claim 2 or 3, characterised in that the motor vehicle transmits the information relating to the current location to the control centre depending on the route.
5. Navigation method according to claims 1 to 4, characterised in that the control centre transmits further information relating to the route to the motor vehicle.

6. Navigation method according to claim 1, characterised in that the control centre automatically determines the information relating to the starting location and/or the relevant location during a journey.
7. Navigation device according to claim 1, characterised in that the motor vehicle informs the control centre of the route pattern travelled and the control centre determines the current location therefrom on the basis of the relevant map reality and informs the motor vehicle thereof.

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1 page of drawings included

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